

Remarks

Claims 1-39 are pending in the subject application. Applicants acknowledge that claim 40 has been withdrawn from further consideration as being drawn to a non-elected invention. By this Amendment, Applicants have canceled claims 5, 14, 24, 33, and 40, amended claims 1, 6, 7, 19, 20, 25, 26, and 38, and added new claim 41. Support for the amendments and new claim can be found throughout the subject specification and in the claims as originally filed. Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 1-4, 6-13, 15-23, 25-32, 34-39, and 41 are currently before the Examiner. Favorable consideration of the pending claims is respectfully requested.

As an initial matter, the Examiner objects to the listing of references in the specification as not a proper Information Disclosure Statement (IDS). Applicants submitted an Information Disclosure Statement in the subject application on November 14, 2003. Applicants note that not all references listed in a specification need be disclosed in an IDS. Applicants respectfully assert that their duty of disclosure under 37 CFR §1.56 has been met by the IDS filed November 14, 2003.

Claims 20-30 and 33-39 are rejected under 35 USC §101 because the claimed invention is directed to non-statutory subject matter. The Examiner indicates that the claimed plant, plant tissue, or plant has the same characteristics as those of naturally occurring plant, plant tissue, or plant cells and, therefore, does not constitute patentable subject matter. By this Amendment, Applicants have amended claim 20 to recite that the plant, plant tissue, or plant cell is transgenic or transformed with a polynucleotide that encodes a  $\beta$ -amylase enzyme. The claim requires that expression of the polynucleotide provides the plant, plant tissue, or plant cell with increased resistance to an environmental stress condition. Applicants respectfully assert that the claims do not read on naturally occurring subject matter. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §101 is respectfully requested.

Claim 1 is rejected under 35 USC §112, second paragraph, as indefinite on the grounds that the last step of the claimed method is inconsistent with the preamble. Applicants have amended claim 1 to recite that the method results in a plant that exhibits increased resistance to an environmental stress condition. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claims 6 and 25 are rejected under 35 USC §112, second paragraph, as indefinite in the recitation of “reduced inhibition by maltose.” Applicants respectfully assert that the claims are not indefinite and that an ordinarily skilled artisan would understand the metes and bounds of the claims. The claims contemplate an enzyme whose enzymatic activity is less inhibited by maltose than a normal plant  $\beta$ -amylase enzyme. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claims 7 and 26 are rejected under 35 USC §112, second paragraph, as indefinite in the recitation of “thermostable”. Applicants respectfully assert that the claims are not indefinite and that an ordinarily skilled artisan would understand the metes and bounds of the claims.  $\beta$ -amylase enzymes that exhibit increased thermostability are known in the art (see, for example, Mikami, *et al.* (1999) and Yoshigi, *et al.* (1995), both of which were cited in Applicants’ Information Disclosure Statement). Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claims 14 and 33 are rejected under 35 USC §112, second paragraph, as indefinite in the recitation of “promoter drives increased expression”. Applicants respectfully assert that the claims are not indefinite and that an ordinarily skilled artisan would understand the metes and bounds of the claims. However, by this Amendment, Applicants have canceled claims 14 and 33, thereby rendering the rejection moot. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claims 19 and 38 are rejected under 35 USC §112, second paragraph, as indefinite in the recitation of “relative to a plant when said polynucleotide has not been introduced.” In accordance with the Examiner’s suggestion, Applicants have amended claims 19 and 38 to insert the text “of the same variety” after the text “...relative to a plant” and before the text “wherein said polynucleotide . . .” Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claim 20 is rejected under 35 USC §112, second paragraph, as indefinite in the recitation of “bred”. The Examiner asserts that it is unclear how a plant tissue or plant cell is bred and that it is unclear what is intended. Applicants assert that the claim is not unclear or indefinite. Plants can be bred with another plant, and plant cells or plant tissue obtained from the progeny of the plants that

were bred. However, by this Amendment, Applicants have canceled the language “bred” from the claim; thus, the rejection is moot. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claims 1-39 are rejected under 35 USC §112, first paragraph, as nonenabled by the subject application and as lacking sufficient written description. The Examiner asserts that the subject specification is not enabling and does not provide written description for enzymes other than  $\alpha$ -amylase and  $\beta$ -amylase, or for enzymatically fragments of enzymes, or for amylase enzymes that are thermostable or that exhibit reduced inhibition by maltose. By this Amendment, Applicants have amended independent claims 1 and 20 to recite that the polynucleotide encodes a  $\beta$ -amylase enzyme. This amendment has been made solely to expedite prosecution of the subject application to completion and should not be construed as an indication of Applicant’s agreement with the Examiner’s position under this rejection. Applicants also respectfully assert that amylase enzymes that are thermostable or that exhibit reduced inhibition by maltose are known in the art to an ordinarily skilled artisan. Accordingly, reconsideration and withdrawal of the enablement rejection under 35 USC §112, first paragraph, is respectfully requested.

Claims 1, 5, 9, 10, 14-20, 24, 28, 29, and 33-39 are rejected under 35 USC §102(b) as anticipated by Gausing *et al.* (U.S. Patent No. 5,498,832) as evidenced by Rizhsky *et al.* (2004). The Gausing *et al.* patent is cited as teaching a transgenic plant (potato or rice) and a method of producing the transgenic plant comprising introducing a polynucleotide encoding  $\alpha$ -amylase, operably linked to a promoter that drives the increased expression of the  $\alpha$ -amylase coding region. Applicants respectfully assert that the Gausing *et al.* patent does not teach or suggest Applicants’ claimed invention. However, as noted previously, Applicants have amended claims 1 and 20 to recite that the polynucleotide encodes a  $\beta$ -amylase enzyme. As the Examiner is aware, in order to anticipate, a single reference must disclose within the four corners of the document each and every element and limitation contained in the rejected claim. *Scripps Clinic & Research Foundation v. Genentech Inc.*, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991). The Gausing *et al.* patent does not teach or suggest introducing a polynucleotide encoding a  $\beta$ -amylase enzyme into a plant. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §102(b) is respectfully requested.

Claims 1-5, 7-11, 14-21, 23-30, and 33-39 are rejected under 35 USC §103(a) as obvious over Gausing *et al.* (U.S. Patent No. 5,498,832) in view of Seki *et al.* (2001). In addition, claims 1-5, 8-24, and 28-39 are rejected under 35 USC §103(a) as obvious over Gausing *et al.* (U.S. Patent No. 5,498,832) in view of Seki *et al.* (2001) and Grover *et al.* (2001). The Gausing *et al.* patent is cited for the teachings as discussed in regard to the rejection under 35 USC §102. The Seki *et al.* reference is cited as teaching increased expression of the β-amylase gene in a plant in response to cold stress. The Grover *et al.* reference is cited as teaching the use of a stress inducible promoter. The Examiner concludes that it would have been obvious to use β-amylase in a method to provide a plant with increased resistance to an environmental stress condition. Applicants respectfully traverse this rejection.

Applicants respectfully assert that the cited references, taken alone or in combination, do not teach or suggest the claimed invention. As noted previously, Applicants have amended claims 1 and 20 to recite that the polynucleotide encodes β-amylase enzyme. Although the Seki *et al.* reference teaches increased expression of numerous genes in a plant in response to drought or cold stress, of which β-amylase is but one, the reference does not teach the function of amylase expression or what effects on the plant result from amylase expression. The cited references do not teach or suggest that overexpression of β-amylase in a plant can provide the plant with increased resistance to environmental stress conditions. As the Examiner is aware, it is well established in patent law that in order to support a *prima facie* case of obviousness, a person of ordinary skill in the art must find both the suggestion of the claimed invention, and a reasonable expectation of success in making that invention, solely in light of the teachings of the prior art. *In re Dow Chemical Co.*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). In the cited references, one finds neither the suggestion of the claimed invention nor the required reasonable expectation of success. It is only the subject application that teaches expression of β-amylase in a plant can provide increased resistance to environmental stress conditions. Hindsight reconstruction of references to try to arrive at an Applicant's claimed invention is not permitted. *In re Sponnoble*, 160 USPQ 237, 243 (CCPA 1969). Accordingly, reconsideration and withdrawal of the rejections under 35 USC §103(a) is respectfully requested.

It should be understood that the amendments presented herein have been made solely to expedite prosecution of the subject application to completion and should not be construed as an indication of Applicants' agreement with or acquiescence in the Examiner's position.

In view of the foregoing remarks and amendments to the claims, Applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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